THREE NEW SPECIES OF THE GENUS *CLOACINA* LINSTOW (NEMATODA: STRONGYLATA) FROM MACROPOD MARSUPIALS

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Summary

Three new species of *Cloacina* are described: *C. mundayi* from *Macropus rufogriseus*, from Tarraleah, Tasmania, characterised by the presence of a dorsal buccal tooth associated with the duct of the dorsal oesophageal gland; *C. clarkae* from *M. eugenii*, from Kangaroo Island, South Australia, characterised by the shape of the cephalic papillae and the structure of the oesophagus; *C. edwardsi* from *M. bicolor*, from Sunday I., Victoria, characterised by the presence of oesophageal 'plumes', very short spicules and very short vagina.

Cloacina mundayi n.sp.

FIGS. 1–7

Host and locality: *Macropus rufogrisea*, from Tarraleah, Tas.

This species is a relatively short stout nematode. The material consists of four males and four females. The submedian papillae are small, with the distal segment much smaller than the proximal. The long threadlike cervical papillae are close to the anterior end.

The shallow buccal ring is somewhat hexagonal in shape, and is uneven in depth. A small dorsal oesophageal tooth projects into the buccal cavity, and is traversed by a duct from the dorsal oesophageal gland. The oesophagus is cylindrical, widening only slightly at the posterior end. No teeth are present in the lumen. The nerve ring is at about the mid-length of the oesophagus, and the excretory pore shortly behind it.

The posterior end of the female tapers from in front of the vulva to the tip of the tail; the distance from the anus to the vulva is about equal to the tail length. The vagina is slightly longer than the tail. The eggs are 110 by 65 μm.

The spicules are about 1/2.5–3.0 of the body length. The dorsal lobe of the bursa is unusually long for the genus, and the ventral lobes are united. The bursal rays are as shown in Figs. 6 and 7. The genital cone is short and conical, and on either side of it there is a cuticular inflation. No accessory cone can be seen. Measurements are given in Table 1.

This species is distinguished from all others so far described in the shape of the bursa and in the presence of a dorsal tooth in the buccal capsule. In describing *C. dahli*, Linstow (1897, p. 287) mentions the presence of a gland (seen in T.S.) in the dorsal wall of the oesophagus, with a duct opening dorsally (presumably into the lumen of the oesophagus or into the mouth). Such a distinct gland has not been noted in descriptions of other species of the genus, nor in re-examination of fresh material of various species. It is not present in *C. clarkae* or *C. edwardsi*. In the description of *C. dahli* there is no indication of a dorsal tooth associated with the gland.

Cloacina clarkae n.sp.

FIGS. 8–13

Host and locality: *Macropus eugenii*, from Kangaroo I.

This is a large worm from the stomach of the host. The submedian papillae are long and slender, and the distal segment of each is distinctly longer, but not wider, than the proximal one. The cuticle is thickened just behind the cervical groove. The threadlike cervical papillae are relatively close to the anterior end. The buccal ring is deep, its walls relatively thin, and sloping outwards towards the anterior end; the anterior margin is lobed.

The oesophagus is long and slender, except for a distinct terminal bulb. It is clearly divided into four regions—(1) in the anterior half there are 9–11 distinctive equidistant places where the lining appears to be creased; (2) in the rest of the cylindrical part of the oesophagus the cuticle is more or less featureless; (3) just below the terminal bulb, the oesophagus and its lumen are slightly wider, and in this region about 8 well developed teeth project

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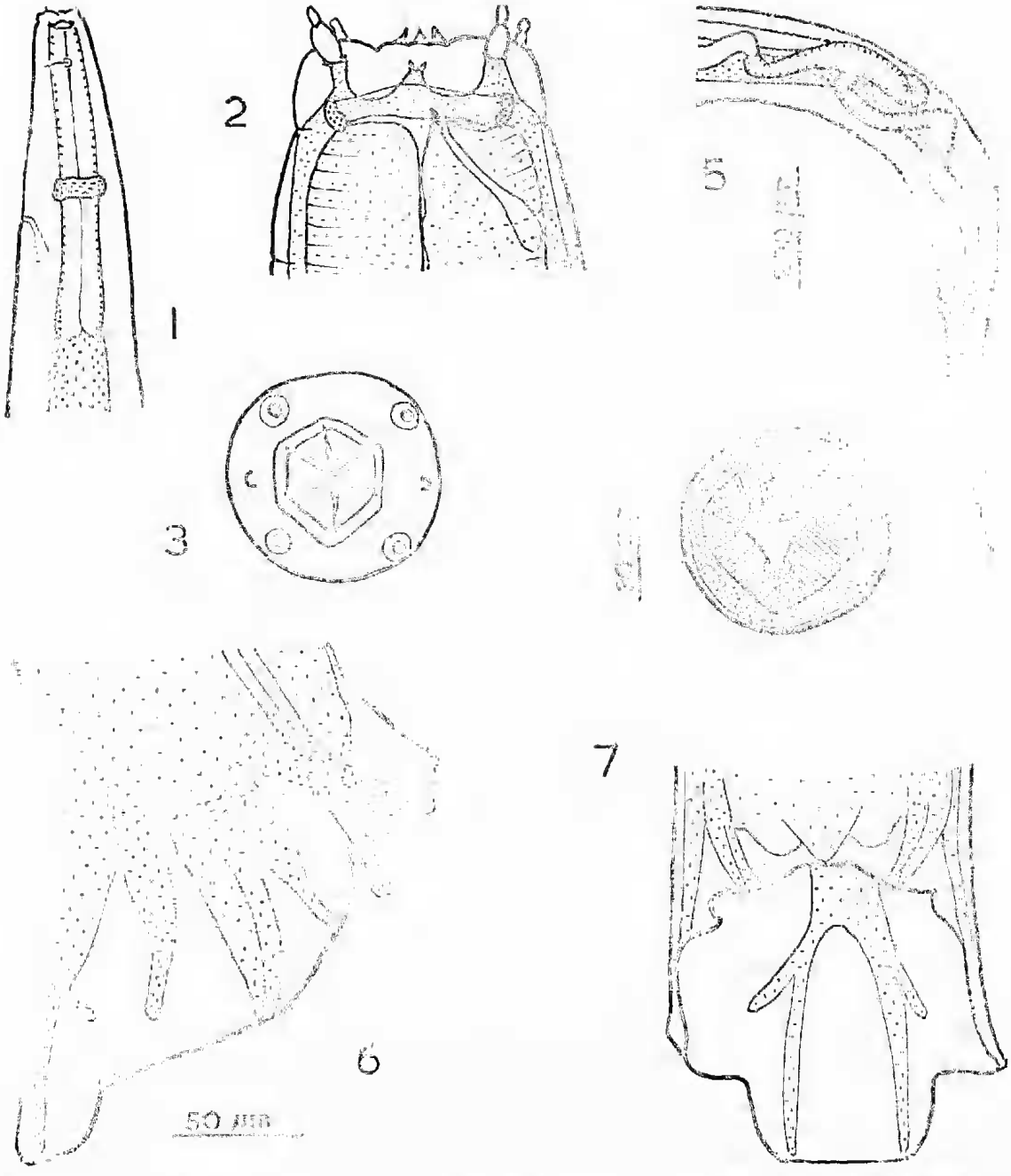
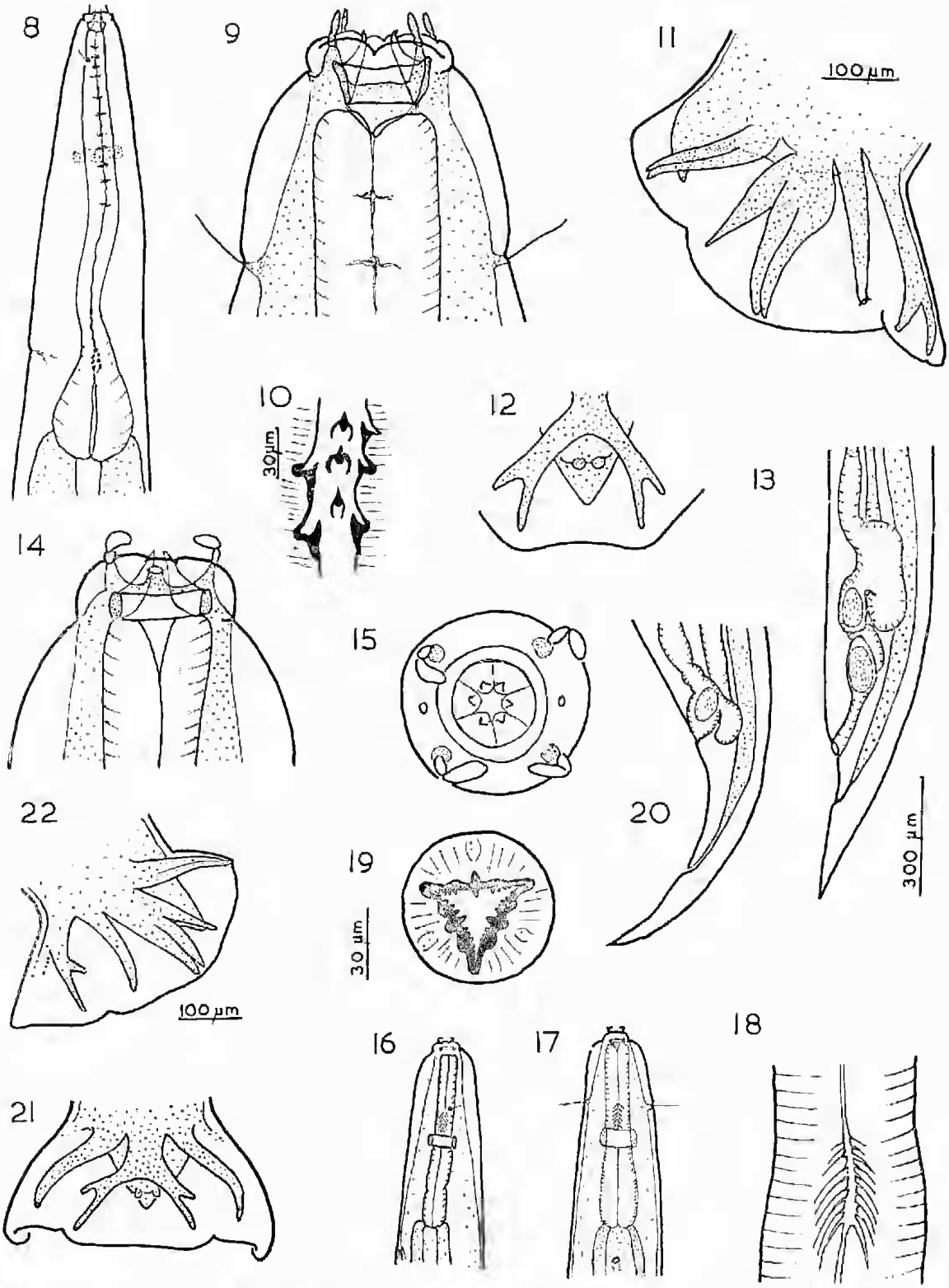


Figs. 1–7. *Cloacina mundayi*. Fig. 1.—Oesophageal region. Fig. 2.—Head, lateral view. Fig. 3.—Head, *en face*. Fig. 4.—T.S. anterior end shortly behind buccal ring. Fig. 5.—Posterior end of female. Figs. 6, 7.—Lateral and ventral views of bursa.

Figs. 8–13. *Cloacina clarkae*. Fig. 8.—Lateral view of oesophageal region. Fig. 9.—Head, ventral views. Fig. 10.—Part of oesophagus showing teeth in lumen. Fig. 11.—Lateral view of bursa. Fig. 12.—Dorsal ray and genital cone. Fig. 13.—Posterior end of female.

Figs. 14–22. *Cloacina edwardsi*. Figs. 14, 15.—Lateral and *en face* views of head. Figs. 16, 17.—Oesophageal regions of male and female respectively. Fig. 18.—Part of oesophagus showing plumose structures. Fig. 19.—T.S. oesophagus in region of plumose structures. Fig. 20.—Posterior end of female. Figs. 21, 22.—Dorsal and lateral views of bursa.



Figs. 8, 13, 16, 17 and 20 to scale beside Fig. 13.
Figs. 9 and 10 to scale beside Fig. 10.
Figs. 14, 15, 18 and 19 to scale beside Fig. 19.
Figs. 21 and 22 to scale beside Fig. 22.

into the lumen (Figs. 8, 10); (4) the terminal bulb. The nerve ring lies at about a third the length of the oesophagus from the head, and the excretory pore at the level of the anterior end of the oesophageal bulb.

In the female the tail is conical and pointed, and the vulva is about half the tail length in front of the anus. The vagina is rather longer than the distance from the vulva to the tip of the tail, and is somewhat convoluted. The eggs are about 173 x 80 μm, and contain a "tadpole" stage larva.

The bursa is much shorter ventrally than dorsally. The arrangement of the rays is shown in Figs. 11 and 12. The genital cone is well developed and bears dorsally a short pair of appendanges. The spicules are a little more than a quarter of the body length; a gubernaculum is present.

The species is among the medium-large sized *Cloacina* spp., and can be distinguished by the characters of the head and oesophagus. It is perhaps closest to *C. communis* Johnston & Mawson (1939), which however is larger, and in which the oesophageal teeth are arranged differently (Mawson 1961, p. 196).

The specific name is given in recognition of the work of Miss Helen Clark who isolated the worm, and who included a study of the early stages of the life history in work for an Honours Degree in this Department.

Cloacina edwardsi n.sp.

FIGS. 14–22

Host and locality: *Wallabia bicolor*, from Sunday I., Vic.

This apparently new species of the genus *Cloacina* belongs to the group in which the distal segments of the submedian cephalic papillae are much larger than the proximal segments. The cuticle behind the head is thick, becoming less so towards the base of the oesophagus. The long threadlike cervical papillae lie shortly in front of the level of the nerve ring. The buccal ring is short, wide and stoutly built, the walls oval to triangular in section.

The oesophagus is short, more or less cylindrical, with a small terminal swelling in the female, but not in the male. There are no teeth in the lumen, but there are three very distinct "plumose" areas, one on each of the three walls of the lumen (Figs. 18, 19), in the region just anterior to the nerve ring. These areas are formed by confluent ridges on the cuticle lining the lumen. They appear to be similar in form to such structures figured and described for some *Murshidia* spp. from elephants and rhinoceros, but have not previously been described from Australian trichonematines.

The nerve ring surrounds the oesophagus at or just behind its midlength, and the excretory pore is just post-oesophageal.

The posterior end of the female tapers gradually from about the vulva, ending in a slender pointed tail; the vulva is rather more than a tail length in front of the anus. The vagina is very short. The eggs are 83 x 50 μm.

The spicules are unusually short for *Cloacina* spp., about 1/14 of the body length; a gubernaculum is present. The genital cone is well developed, conical, with two small projections forming the accessory cone. The form and arrangement of the bursal rays are shown in Figs. 21 and 22.

This species is distinguished from any previously described by the presence of the plumose structures in the oesophagus, as well as by the unusually short spicules and the very short vagina.

Acknowledgements

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TABLE 1

Measurements of Cloacina edwardsi, C. mundayi *and* C. clarkae; *unless otherwise indicated, measurements are in μm*

	C. edwardsi		*C. mundayi*		*C. clarkae*	
	male	female	male	female	male	female
Length (mm)	6.3	6.5–7.7	3.1–3.4	4.4–5.0	8.8–9.2	12.3–13.6
Oesoph. length	480	470–520	470–490	470–570	1100–1220	1250–1350
Antr. end—nerve ring	260	250–290	250–260	250–320	300–350	300–350
—cervical pap.	220	170–200	100	80–90	115–160	110 (3x)
—excret. pore	550	480–610	250–340	330–350	890–900	930–1020
Spicule length	430	—	1100–1150	—	2400–2600	—
Tail length	—	290–300	—	210–250	—	260–350
Vulva postr. end	—	680–730	—	410–500	—	430–500
Length/oesoph. L	13	13–15	6.5–7.1	8.6–9.3	7.2–8.5	9.5–10.7
Length/spic. L	14.6	—	2.8–3.0	—	3.4–3.7	—